

8.4.2 QUALITY-CONTROL PROCEDURES AND REQUIREMENTS

Quality-control samples are a requisite for any sample-collection and analysis program. Quality-assurance procedures involving quality-control samples are not to be viewed as an option. Quality-control procedures for bottom-material sampling will entail use of split field samples and concurrent replicate field samples.

- ▶ The recommended minimum quality-control samples is 10 percent of the total number of samples collected per year (total for all field-collected quality-control samples).
- ▶ For long-term projects that entail multiple sampling sites, an attempt should be made, during the life of the project, to collect at least one set of field quality-control samples at every sampling site used for that project.
- ▶ If seasonal variations are suspected, an attempt also should be made to collect field quality-control samples under various seasonal conditions.

8.4.2.A Split Samples

Split samples are designed to determine analytical precision for chemical constituents in a “real-world” sample matrix. A split sample is an aliquot of an already collected, homogenized, processed, and preserved sample. Split samples are prepared by partitioning a larger volume of processed sample from one container into equal subsamples; samples are split in an enclosed environment and using equipment and methods that preclude sample contamination.

Concurrent Replicate Samples 8.4.2.B

Concurrent replicate samples are two samples that are collected using identical methodology, as closely together in time and space as possible (Horowitz and others, 1994). Concurrent sample data are intended to provide the user with a measure of sampling precision and (or) are intended to indicate inhomogeneities in the system being sampled.

To collect and process concurrent replicate samples:

1. Starting with the first sampling point, collect a sample for compositing and place it in a field-rinsed compositing device.
2. Reoccupy (in close proximity) the first sampling point, collect a second sample, and place it in a second field-rinsed compositing device.
3. Go to the second sampling point, collect a sample, and place it in the second compositing device.
4. Reoccupy (in close proximity) the second sampling point, collect a sample, and place it in the first compositing device.
5. Continue to sample remaining sampling points in this manner, continuing to alternate placement of samples in first and second compositing devices.
6. After all sampling points have been visited, two compositing devices will contain an approximately equal volume of representative samples.
7. Process the first composited sample (see section 8.5); if a split field sample is needed, partition the sample into two appropriate sample containers, with one labeled "Site x, Sample 1, Split A" and the other labeled "Site x, Sample 1, Split B."
8. Process the second sample, and then if a split field sample is needed, partition it into two appropriate sample containers, with one labeled "Site x, Sample 2, Split A" and the other labeled "Site x, Sample 2, Split B."